SECTION 4

DOORS AND OTHER ACCESS CLOSURES

4.1 REFERENCES

(4A) ADA Accessibility Guidelines for Buildings and Facilities (ADAAG), as amended through September 2002

(4B) Code of Federal Regulations – 46 CFR Sub-chapter H

(4C) Code of Federal Regulations – 46 CFR Sub-chapter I

(4D) Code of Federal Regulations – 46 CFR Sub-chapter J

(4E) NVIC 9-97, *Guide to Structural Fire Protection*

4.2 INTRODUCTION

This Section contains the Contractor Design and Provide general requirements for side ports, fire, joiner and watertight doors, hatches, manholes, scuttles and other closures throughout the Vessel. Door hardware requirements are addressed in Section 21 of the Technical Specification.

For WSF Fleet-wide Standardization purposes, End No. 1 of the Vessel shall always be considered the bow, and this designation shall delineate port and starboard, fore and aft wherever they are addressed in the Technical Specification.

4.3 GENERAL

The Contractor shall design and provide all doors, hatches, manholes, scuttles, and other closures as required to provide direct and unambiguous access to and from all portions of the Vessel. Closures and all access pathways shall be arranged so as to meet the requirements of WSF and the Authoritative Agencies, including but not limited to fire safety, emergency egress, security, persons with disabilities, operations, and maintenance. Specific closure requirements are outlined below. Specific information required by WSF as part of the Phase II Technical Proposal, and as part of the Phase III Detail Design is provided at the end of this Section of the Technical Specification.

WSF has experienced significant door problems throughout its fleet in the past. Therefore, WSF desires to install demonstratable quality door systems that will address problems encountered in its Fleet as to fit, operation, quality, and corrosion resistance as follows:

- Each door manufacturer shall submit through the Contractor a list of all current users of its proposed door systems who have used these doors for a minimum of three (3) years.

- For each current user of its door system(s), the Contractor shall provide the user's business name, contact person's name, address, telephone, fax and e-mail (if available). The contact person must be English speaking, available for telephone interview, and have a position with detailed knowledge of the operation and maintenance of the specific door installations. WSF may call some or all of these references as well as any other encountered sources with requisite knowledge of the Contractor's proposed door system(s).

All closures and installations shall meet the requirements of the USCG for the type and location specified. All doors and hatches, except as noted herein, shall be operable from both sides, and shall be complete with all hardware, latches, hinges, locks, security locks, keys, hook holdbacks, bumpers, etc., required for the particular doors and hatches. See Section 21 of the Technical Specification.

NOTE: The Vessels shall have an integrated surveillance camera and monitoring, access control, and intrusion alarm security system which shall require security locks and access monitoring/control. See Sections 12, 21 and 95 of the Technical Specification for system requirements.

Side ports, doors, hatches, manholes, scuttles and other closures shall be provided to give access to all spaces, tanks, cofferdams and voids in accordance with regulations and the Technical Specification.

All non-watertight doors shall meet the requirements of 46 CFR §72.05-25.

Hose ports shall be fitted in doors as necessary for fire control and/or required by regulation.

Interior doors shall open into rooms and not into passageways, except where a specific condition might require an outward swing. Exterior doors shall normally swing out, except doors to spaces in the Machinery Casing shall swing inward. See the *Fire Screen Doors* Subsection in this Section of the Technical Specification.

All doors, hatches, scuttles and other closures shall be fitted with insulation conforming to a fire rating of the bulkhead or deck in which installed as required by the *DOORS* Subsection in this Section of the Technical Specification. Closures shall also be fitted with insulation as necessary to meet the noise criteria of Section 102 of the Technical Specification.

Bulkhead and deck openings shall be suitably stiffened in way of installed closures.

Restroom toilet stall doors shall be as specified in Section 20 of the Technical Specification.

4.4 DOORS

4.4.1 General Construction

Unless otherwise specified elsewhere in the Technical Specification, all doors shall be provided as, at a minimum, "A-15" Class rated fire doors.

The door manufacturer shall produce and have available framed door assemblies in both a left hand and right hand door swing configurations. Merely producing a framed door assembly in a single swing configuration (either left or right) to be installed backwards for the opposite door swing, **will not** be acceptable.

The door manufacturer's fabrication tolerances shall be provided for all doors of a same type to a level that a door from a Spare Door assembly, as set froth in the *Spare Doors* Subsection in this Section of the Technical Specification can be removed from the spare assembly and installed into an existing installed door frame.

For WSF Fleet-wide Standardization and Security purposes, all doors shall be manufactured to accommodate 35H Series BEST LOCKS. See the *LOCKS AND LATCHES* Subsection in Section 21 of the Technical Specification.

Hollow flush-metal-type joiner doors shall be provided throughout the Vessel for privacy, security and fire safety purposes.

Nominal size of all doors shall be the net clear opening size of the frame, measured between door stops for width, and between head stop and sill for height. Unless otherwise noted, as a minimum, tops of doors shall be 6'-8" (80 inches) above the finished deck. The clear openings shall be a minimum of thirty-two (32) inches, except for doors to restrooms and showers in Officer and Crew Staterooms shall have a clear opening of at least twenty-eight (28) inches. Where justified by overall design considerations, the WSF Representative may authorize, in writing on a "case-by-case" basis, the use of doors with smaller dimensions in specific locations upon written request from the Contractor.

All interior fire screen doors forming part of the MVZ; between public spaces and stair towers, stairways, corridors, passageways and foyers; or any combination of these shall be "normally open". This "normally open" condition **does not** include doors in way of Passenger access via the Machinery Casing between the Vehicle Decks and Passenger Deck (companionway doors which are normally closed). All the above mentioned "normally open" doors of this paragraph shall be fitted with a fixed light in the upper

panel with double wire inserted glazed glass of the maximum size allowed by regulation and configured as approved by WSF. Unless specifically noted otherwise in the Technical Specification, all such doors shall include closures, and be fitted with magnetic hold-backs (See Sections 21 and 95 of the Technical Specification).

Except where precluded by a Technical Specification required installation of a louver or light (window) larger than that allowed by regulation for such door types, **all doors** , however designated, shall be constructed and insulated as **fire doors** to meet the requirements of 46 CFR and Reference (4E) and shall in all cases, as a minimum, meet the requirements of an "A-15" Class fire rating. The Contractor shall provide certification with each door that clearly indicates that the door is in full compliance with the appropriate structural fire rating requirements. Each door shall have permanently affixed to the hinge edge, a metal plate identifying the manufacturer, year of manufacture, and statement of compliance.

All joiner doors and non-tight fire doors, regardless of fire rating, shall be insulated with approved structural insulation capable of meeting the USCG requirements for a "A-15" Class bulkhead, except where more stringent standards are required by the Authoritative Agencies for particular doors.

Unless otherwise noted in this Section of the Technical Specification, all steel doors shall be of a minimum of 1¾ inch thick, and made from minimum double thickness of USSG No. 16 (1.5 mm) sheet steel with internal channel stiffeners. All aluminum doors shall be of a minimum of 1⅝ inch thick. See Reference (4E).

All doors and frames shall have reinforcing plates provided inside each door in way of hinges, latches, locks, and closures. The inside of the door frame hinge area shall be reinforced with a with a minimum of a ⅜ inch thick flat bar piece for each hinge. Details of construction in way of hinges and locks shall provide for flush application of the hardware in the metal surface. Hinges shall be as set forth in the *HINGES* Subsection in Section 21 of the Technical Specification. All drilling and tapping for hardware shall be done at the factory.

All interior joiner doors and related hardware shall conform to the standards of ASTM F821 except where its standards are superseded by requirements of this Section or more stringent Authoritative Agency requirements. All doors shall be outfitted with Commercial Grade 1 hardware and self-closures in accordance with Section 21 of the Technical Specification. See the *GENERAL* Subsection in Section 92 of the Technical Specification for ARROW HART, illuminated, two-pole switches that mount in the door jambs.

Where required for ventilation, doors shall be provided with louvers of like material in the lower half sized in accordance with velocity limits as specified in Section 12 of the Technical Specification. Louver panels, where fitted for doors in "B" Class bulkheads, **shall not** pass light.

Doors shall be predrilled to accept mortise type locksets; see Section 21 of the Technical Specification for specific models and information.

Metal doors and frames shall be constructed of steel or aluminum as required by this Technical Specification conforming to the ASTM Standards and treated at the mill to be free of scale, warp and buckles. All exposed welds on the door shall be ground off flush and smooth. Plastic, liquid or putty fillings **shall not** be allowed.

Corner bends shall be true and straight and of minimum radius for the gauge of metal used.

Door frames shall be of Type 304 stainless steel single rabbet design or angle design. They shall be formed with flanges for welding or bolting into bulkhead openings. Rabbets shall be not less than $\frac{5}{8}$ inch deep.

Watersheds shall be provided over all exterior doors not protected by deck overhangs. Watersheds shall also be provided above all doors in the casing that are exposed to sprinkler system water during sprinkler system testing. Watersheds shall be fabricated out of a minimum of $^{3}/_{16}$ inch thick steel flat-bar and continuously welded to the structure.

Gaskets shall be fitted between the door and frame stops of all doors. Unless otherwise specified, gaskets may be fitted in the doors or in the frame stops. Pilothouse doors shall have sufficient type gaskets to ensure minimum air infiltration from the weather.

Unless otherwise specified elsewhere in the Technical Specification, all exterior (weather) doors shall be of steel construction (both faces). Door face sheets shall be no lighter than No. 11 gauge on weather side and No. 16 gauge on interior side. Seams on weather doors which could pass water shall not be acceptable on the weather sides of any door. All such seams required for fabrication shall be welded tight, sealer in such seams will not be acceptable. Door frames shall be no lighter than 10.2# (¼" thick) ASTM A36 steel and shall be designed and installed to present a finished look without ragged opening frame door-to-structure gaps, exposed latch throws, striker plate screws, and the like on both sides of the frame after installation.

NOTE: Exterior (weather) doors are defined as all doors where one or more surface faces a weather area. All doors facing to the Vehicle Decks (including

Tunnel area) are considered, under this Contract, as exterior (weather) doors.

The exterior doors shall have a ½ inch high stainless steel sill with underlayment sloping away from the interior and suitable weather stripping to insure weather tightness.

All fixed light installations, unless otherwise specified in this Technical Specification, shall use wire inserted glass and meet the requirements for fire rated doors.

Lower edges of doors shall be parallel to base line with bottom of sills scribed to fit camber, and/or deck irregularities.

Thresholds for interior doors shall be stainless steel. Finished height is to be approximately ⅛ inch above the finished deck covering unless otherwise noted.

Elevator trunk doors shall be provided and installed as specified in Section 23 of the Technical Specification.

To facilitate the application of full coating systems to include under hinges, latches, brackets, latches, and the like, all doors and frames unless otherwise noted shall be furnished with a factory applied enamel wet system finish coating matching the coating type as set forth in Section 14 of the Technical Specification and color scheme required in Section 25 of the Technical Specification. When finished, all surfaces shall be free of visible scratches, weld splatter, spots or depressions, and present a flat and smooth appearance.

Weld-in type door frames shall be furnished with a factory inorganic zinc primed finish prior to Contractor installation. After installation, the Contractor shall apply an enamel finish to the door frame matching the coating type as set forth in Section 14 of the Technical Specification and the color scheme required in Section 25 of the Technical Specification. Toilet stall doors shall be as specified in Section 20 of the Technical Specification.

4.4.2 Spare Doors

The Contractor shall provide a quantity, as set forth in **TABLE 4-1** below, of spare door assemblies for each door type/configuration used onboard the Vessels. Door assemblies shall include door, hinges, fasteners, light (if applicable), and frame. These doors shall be enclosed in individual, screw constructed, wooden crates, suitable for long term warehouse storage and forklift transport. Crates shall be properly and permanently stenciled labeled to identify the door type/configuration, size, swing, light, and Vessel Class to allow the user to identify a door assembly without the need to open the crate.

Delivery of the door assemblies shall be provided by the Contractor to a WSF warehouse as designated by the WSF Representative at the end of the Contract.

NOTE: "Type/configuration" of a door assembly is here defined as those salient characteristics which includes construction, size, materials, finish, structural classification, attachments, door swing, hinges, and light (if applicable) which creates a WSF approved unique door assembly as installed on the Vessel.

For bidding purposes the Contractor shall provide spare door assembly quantities under this Contract as set forth below:

TABLE 4-1
REQUIRED SPARE DOOR ASSEMBLY QUANTITIES
(quantities are a total for the Contract, and based upon those doors installed on one (1) Vessel)

Door Assembly Quantity/Location Used Per Type/Configuration (single Vessel)	Required Spare Assemblies
1 -5	2
6 - 10	5
11 -25	7
26 and more	25% of installed type/configuration rounded up to next quantity.

4.4.3 Fire Screen Doors

Fire screen doors (FSD) shall be PACIFIC COAST MARINE INDUSTRIES Inc. (similar to Pacific Coast Marine Drawing No. PCM-C-11807), or equal, of hollow steel construction, structurally insulated, fitted with an 3 inch × 33 inch fixed light, self-closures, magnetic hold-backs, and other equipment as required for doors in stairways and fire zone bulkheads, excepted as specified otherwise in this Section of the Technical Specification. PACIFIC COAST MARINE INDUSTRIES Inc. is located in Everett, Washington

Machinery Casing doors shall provide the door hardware not intruding into the vehicle pathway. Doors assemblies in the casings shell be of the recessed type (similar to PACIFIC COAST MARINE Drawing No. PCM-C-11810) to prevent collision damage to either the door hardware or vehicles.

Fire screen doors on the Passenger Deck indicated as "normally open" shall be hinged and recessed into the bulkhead in the open position so that the door face will present a smooth, finished bulkhead appearance.

Fire screen doors on the Lower Vehicle Deck accessing the stair towers in the Machinery Casing shall be hinged.

Fire screen doors on the Lower Vehicle Deck accessing certain Machinery Casing areas and the Rescue Boat Stations access (see Section 16 of the Technical Specification), and as required by the Contractor's design shall be hinged double doors.

Fire screen doors on the Upper Vehicle Deck accessing the stair towers shall be MOMEC MV 4166-2080 C with ELOMEK type 721/722 magnetic door holdbacks, or equal, sliding doors.

Fire screen doors shall be labeled in accordance with this Section and Section 24 of the Technical Specification.

See the *RESCUE BOATS AND DAVITS* Subsection in Section 16 of the Technical Specification for steel fire screen double door requirements for the Rescue Boat Stations.

4.4.4 Non-Tight Weather Screen Doors

For WSF Fleet-wide Standardization Testing Purposes, non-tight weather screen doors shall be provided at the locations as set forth in **TABLE 4-2** below:

TABLE 4-2

NON-TIGHT WEATHER SCREEN DOORS

Door Type	Opening Size	Approx. Vessel Location
UVD to Passenger Cabin Single Door @ UVD	48"	End No. 1, Port
UVD to Passenger Cabin Single Door @ UVD	48"	End No. 1, Stbd
UVD to Passenger Cabin Single Door @ UVD	48"	End No. 2, Port
UVD to Passenger Cabin Single Door @UVD	48"	End No. 2, Stbd
Passenger Cabin To Sun Deck Single Door @ Sun Deck	48"	End No. 1, Stbd
Passenger Cabin To Sun Deck Single Door @ Sun Deck	48"	End No. 2, Port

The abovementioned non -tight weather screen doors shall be PACIFIC COAST MARINE INDUSTRIES Inc., or equal, of hollow steel and aluminum construction, structurally insulated, fitted with a 30 inch × 48 inch fixed ⅜" tempered clear light each (similar to PACIFIC COAST MARINE Drawing No. PCM-C-11808), power assisted opening mechanism, tubular locks, kick plates, push plates, pull handles, and other equipment as required for doors in stairways bulkheads of this type. See Section 21 of the Technical Specification. It is the desire of WSF to have the MES Station doors also fabricated with aluminum, same as the doors covered in the Non-Tight Weather Screen Doors above if same is possible as set forth in the regulations.

4.4.5 Non-Tight Fire Screen Doors

For WSF Fleet-wide Standardization Testing Purposes, non-tight fire screen doors shall be provided at the locations as set forth in **TABLE 4-3** below:

TABLE 4-3

NON-TIGHT FIRE SCREEN DOORS

Door Type	Opening Size	Approx. Vessel Location
Passenger Cabin to Picklefork Double Door	72"	End No. 1, Port
Passenger Cabin to Picklefork Double Door	72"	End No. 1, Stbd
Passenger Cabin to Picklefork Double Door	72"	End No. 2, Port
Passenger Cabin to Picklefork Double Door	72"	End No. 2, Stbd
Passenger Cabin To Sun Deck Single Door @ Sun Deck	48"	End No. 1, CL
Passenger Cabin To Sun Deck Single Door @ Sun Deck	48"	End No. 2, CL

The abovementioned non-tight fire screen doors shall be PACIFIC COAST MARINE INDUSTRIES Inc., or equal, of hollow steel (or aluminum as noted below) construction, structurally insulated, fitted with a 24 inch × 48 inch fixed ⅜" tempered clear light each (similar to Pacific Coast Marine Drawing No. PCM-C-11809 for a 48-inch door, or equal), tubular locks, kick plates, push plates, pull handles, and other equipment as required for doors in stairways "A-0" fire zone bulkheads of this type. The 36-inch doors at the Passenger Deck to Picklefork locations shall be same to the 48-inch doors as to construction and with the same sized clear light, only built to the 36 inch width. Those doors requiring

power assisted opening mechanisms shall be as set forth in the *POWER ACTUATION DOOR SYSTEMS* Subsection in Section 21 of the Technical Specification.

NOTE: It is the desire of WSF to have the above mentioned non-tight fire screen doors also fabricated with aluminum, same as the doors covered in the *Non-Tight Weather Screen Doors* Subsection in this Section of the Technical Specification, if same is possible as set forth in Reference (4E), Chapter 3.10, as exterior doors exiting to open decks from low fire risk spaces. The Contractor shall present the case and submit a request to the USCG for approval of the use of this type of door for the above low fire hazard locations. If the USCG does not approve such aluminum construction for these doors, the doors shall be fabricated as set forth in this Subsection of this Technical Specification to meet all USCG requirements.

4.4.6 Joiner Doors

Joiner doors shall be of hollow steel construction, structurally insulated, fitted with equipment as required for doors in joiner applications. Fire rated doors shall be provided in all "A" and "B" Class bulkheads.

4.4.6.1 Interior Joiner Doors

Doors in the Engineer Operating Station (EOS) and machinery spaces that are not fire doors shall be fitted with mechanical holdback latches.

Refer to the *ACOUSTIC DOORS* Subsection in this Section of the Technical Specification for requirements peculiar to the acoustically treated doors.

In the stair tower between the Vehicle Decks and the Passenger Deck, an interior joiner door shall be fitted on the Upper Vehicle Deck level to act as a wind and weather barrier. A power assisted opening mechanism shall be provided that meets the requirements of Reference (4A). Mechanical hold back latches shall also be provided and fitted.

Unless otherwise noted in this Section of the Technical Specification, all doors shall be of a minimum of 1¾ inch thick, and made from minimum double thickness of USSG No. 16 (1.5 mm) sheet steel with internal channel stiffeners. See Reference (4E).

4.4.6.2 Exterior Joiner Doors

Exterior (weather) doors shall be PACIFIC COAST MARINE INDUSTRIES Inc., or equal, (similar to Pacific Coast Marine Drawing No. PCM-C-11807), of

steel construction. Door frames shall be no lighter than ¼" mild steel. Exterior face sheets shall be no lighter than No. 11 gauge.

Each door's inside perimeter shall be equipped with a replaceable neoprene gasket for complete weathertight contact between the door and frame.

All public access exterior/weather doors in the companionways, and on the Passenger Deck and above shall be fitted with an easily replaceable fixed light, and power assisted opening mechanism in accordance with the requirements of Reference (4A). Doors between the Passenger lounges and the exterior embarkation (Picklefork) areas at the ends of the Passenger deck shall also be fitted with magnetic holdbacks.

Generally, exterior doors shall have a ½ inch high stainless steel sill with underlayment sloping away from the interior and suitable weather stripping to insure weather-tightness.

Exterior doors shall be fit with a closers mounted on the inside (out of the weather). Type and sizing of all closers shall be in accordance with Section 21 of the Technical Specification.

4.4.7 Acoustic Doors

Unless otherwise noted, frames for acoustically treated doors shall be welded completely around the doors, with stops on the sides, tops and bottom.

The boundary bulkhead doors in the Engineer's Dayroom, and Emergency Diesel Generator Room shall have an Authoritative Agency approved fixed light in the upper panel with double wire inserted glazed glass of the maximum size allowed by regulation and configured as approved by WSF. Each glass pane shall be of different thickness, separated by an air gap. The door serving the Chief Engineer's Office, from the EOS, shall have a wire inserted 8 inch × 12 inch double pane window. The space between the plates of glass, if not hermetically sealed, shall have a suitable desiccant added.

The boundary bulkhead doors to the Workshop and the EOS and the Chief Engineer's Office, shall have an Authoritative Agency approved fixed light in the upper panel (except the Chief's Office door shall not have a fixed light) of a PACIFIC COAST MARINE INDUSTRIES Inc., or equal, (similar to Pacific Coast Marine Drawing No. PCM-C-11807 with internal sound barrier addition), or MOMEC A-60 Class, gas tight door, Model MV 4360 G, or equal. Acoustic doors shall provide a sound reduction rating of 1a = 43 dB or greater. Doors shall be reinforced with a one (1) piece flat bar in way of the hinges and all hardware shall be as specified under Section 21 of the Technical Specification. Double gasket door seals as provided are acceptable in lieu of the below requirement.

All acoustic doors shall be fabricated to a standard which ensures the decibel (dB) rating of the doors is equivalent to the dB rating of the bulkhead lining and/or acoustical insulation in which it is installed. (These doors are still required to maintain compliance with "A-15" fire rating if applicable). Gaskets on acoustic doors should be of a material sufficient to ensure sound transmission is prevented through the seats. All Crew Stateroom doors shall be acoustic doors.

NOTE: The Contractor is to take special care to eliminate sound leaks in and around the Work Shop, Engineer's Dayroom, Chief Engineer's Office, Dayrooms, Staterooms, and Emergency Diesel Generator Room doors and frames. Bolts, screws, and/or other fasteners shall be gasketed, isolated, and/or otherwise sealed to minimize noise transmission to the interior of the spaces.. As an alternative to the above, the Contractor may provide a PACIFIC COAST MARINE INDUSTRIES Inc., or equal, (similar to Pacific Coast Marine Drawing No. PCM-C-11807 with internal sound barrier addition), or MOMEC A-60 Class, gas tight door, Model MV 4360 G, or equal; classified A-60 rating with a sound reduction rating of 1a = 43 dB. Doors shall be reinforced with a one (1) piece flat bar in way of the hinges and all hardware shall be as specified under Section 21 of the Technical Specification. Double gasket door seals as provided are acceptable in lieu of the above requirement. Where applicable, door windows shall be as specified above.

4.4.8 Watertight, Sliding Doors

IMS Inc., or equal, Class 3, 24 Vdc (non-hydraulic), electrically operated sliding watertight doors shall be provided in subdivision bulkheads below the Lower Vehicle Deck in accordance with the following:

1. In each bulkhead separating the EOS, Workshop and Storeroom areas from the Engine Room(s) (total two (2) doors per Vessel), provide, provide a minimum of one (1) 48 inch wide × 78 inch door, IMS Model F12 Drawing #351993.04.

2. In each bulkhead separating an Engine Room from Reduction Gear Room (total two (2) doors per Vessel), provide, provide a minimum of one (1) 48 inch wide × 78 inch door, IMS Model F12 Drawing #351993.04.

3. In each bulkhead separating Reduction Gear Room from a Tank Room (total two (2) doors per Vessel), provide a minimum of one (1) 36 inch wide × 78 inch door, IMS Model F12 Drawing #351993.04.

4. In bulkheads separating Machinery Spaces from void compartments or tanks, no doors are required.

5. All forty-eight (48) inch wide doors shall be located along the port side of the Vessel and at the same elevation above the keel at the level of the Engineers Workshop. It is the intent that equipment on a hand truck can be moved from No. 1 Reduction Gear Room through the Vessel to No. 2 Reduction Gear Room with no changes in elevation. All doors will be mounted at grating level and flush to the floor.

24 Vdc watertight doors shall be designed and installed in full compliance with ASTM F1196, ASTM F1197, and Authoritative Agency requirements. The sliding door system shall be complete with all equipment; mechanical, electric control and indication(including control (mimic) panels, optional laser operated safety strip at each door including required control, alarm, indication and bypass on both Pilothouse mimic panels, local alarm and warning lights), electric drive system, and manual emergency operation and shall be manufactured by IMS Inc. USA of Cape Coral, Florida, (239) 772-9299, or equal. All doors shall be the sliding type with horizontal motion. Doors shall be power and manually operable (open/close) from either side of its bulkhead, manually operable (for closing only) from its Lower Vehicle Deck remote station, and power only operable (for closing) from a central control station in each Pilothouse. The central control station shall allow individual or simultaneous closure of all watertight doors and be complete with diagram and door position indicators. Mechanical "open/close" indication shall be provided at each remote control station located on the Lower Vehicle Deck. The control arrangement shall be such that the door will close automatically if opened by local control after being closed from the central control station in either Pilothouse.

A centralized control panel shall be provided in each Pilothouse and shall consist of a diagram with lights indicating the location of each door on the deck and shall contain the following items for each door:

1. Door "Close" switch
2. Door "Open" indicator light, “RED”
3. Door Alarm-Power failure alarm "AMBER"
4. Door "Close" indicator light, "GREEN"

Other components on the control panel include:

1. Buzzer alarm: Audible buzzer sound is triggered if an alarm occurs
2. Reset alarm switch: Turns off the audible buzzer alarm
3. Light Dimmer: Light intensity control for mimic panel

4. Lamp Test Switch: For testing of LED's on mimic panel

One (l) master control switch shall also be installed in each Pilothouse central control panel that will be capable of closing all doors simultaneously.

Operating equipment for each door shall consist of: watertight door, control cabinet, control (mimic) panel, and hand operated emergency generator(s). An alarm horn and flashing light on both sides of the door will activate when door is in operation.

Door assemblies shall be installed so that the bottom of the door opening is flush with the deck and/or grating level.

Instructions and warning plates shall be provided at each control station and at the individual door opening pumps at accumulators.

Control and power supply shall be supplied as required by the USCG and Sections 90, 95 and 96 of the Technical Specification.

The Shipyard shall design and provide the installation under close communication with the factory representative. Final adjustment and testing shall be performed by a factory certified representative.

4.4.9 Weld Mesh Doors

Weld Mesh rectangular doors shall be of the same material and construction as the weld mesh bulkheads, suitably framed and stiffened, and fitted with stainless steel butt hinges and rim lock.

See the *WELD MESH ENCLOSURES* Subsection in Section 3 and 5 of the Technical Specification for additional requirements for weld mesh enclosures.

4.4.10 Fueling Station Sliding Doors

Provide lockable, Type 316, stainless steel weld mesh rectangular sliding doors serving the refueling station on the Lower Vehicle Deck. A sliding door shall be provided on both sides of the Machinery Casing allowing access from both the LVD “wing” and “tunnel” areas.

4.5 SMALL GALLEY SECURITY GRILLES

Design and provide two (2) COOKSON® Co., Classic 126, or equal, side sliding grilles, as indicated on **FIGURE 17-1** in Section 17 of the Technical Specification, to secure the Small Galley area when it is not open for service. Installation shall include all structural or miscellaneous fit work, access panels, finish or trim to opening, construction of storage pockets and finish painting.

4.6 WATERTIGHT HATCHES

As applicable to the Contractor's design, watertight hatches shall be provided for Crew and equipment access to all spaces below the Lower Vehicle Deck other than tanks. Each hatch shall be spring-balanced with hinged end, drop bolt fasteners and quick-acting scuttles. Positive hold-back devices shall be provided to secure hatches in the 'open' position.

Hatches shall be all steel construction with stainless steel springs, stainless steel dogs and bronze hand wheels. All hatches shall be USCG approved.

All Vehicle Deck hatches shall be constructed with steel gasket stops to prevent the hatch gasket from being cut and/or damaged when driven over by heavy machinery.

All hatches shall be provided with drain systems as set forth in this Section and Section 11 of the Technical Specification.

All hatches shall be manufactured by MANLY MARINE CLOSURES (a subsidiary of SEASPAN International Ltd.) Vancouver, B.C. (604) 983-4635), or equal.

Hatches shall be fitted generally as noted below:

- Steering Gear Room access ~ 30 inch × 30 inch clear opening, quick-acting, flush mounted, "T" handle operated top, self-draining, spring loaded, watertight hatches with stainless steel knife edge, wheel operable from below, Manly Model H70. (Ensure prior to procurement and installation that listed model is suitably stiffened to withstand Vehicle Deck design loads). Provide one (1) at centerline for each Steering Gear Room. Hinges shall be located toward Vessel ends.

- Deck Emergency Escape Hatches ~ Oval 22 inch × 28 inch clear opening, quick acting, flush mounted, "T" handle operated top, self-draining, spring loaded, watertight hatch with stainless steel knife edge, wheel operable from below, Manly Model H70

4.7 MANHOLES AND VENTILATION CLOSURES

Bolted manholes with a clear opening of 18 inches × 23 inches shall be provided for access to all tanks and other spaces without previously specified openings. Manholes and/or covers shall be manufactured in accordance with ASTM F1143, Type 1, USCG and ABS requirements. Manhole thickness should be the same as the bulkhead plating thickness where the manhole is being installed. Manholes to water and oil tanks shall be fitted for access in the sides of the tanks, as close to the deckhead as possible. Inner bottom tanks shall have top mounted manholes. All manhole covers shall be secured with bronze nuts and washers on stainless steel studs. Gasket material shall be one (1) piece oil tight or watertight to suit the location. Manhole covers for all tanks containing petroleum products or by-products shall also have woven cotton stud grommets provided under the bronze nuts. All manhole covers, except those in deck areas, shall be fitted with two (2) round bar lifting handles. Hand grips for removal of flush deck access manholes (such as for FO Tanks in EOS and the like) shall be designed so as not to present a trip hazard. Covers in deck areas shall be a minimum of ⅜ inch thick.

Manholes in the Lower Vehicle Deck, in passageways and where deck covering is installed, shall be installed so that the top of the cover plate and bolts are flush with the finished deck covering. All fasteners of flush manhole covers shall be flush stainless steel, countersunk, square head, machine screws of at least $^{5}/_{16}$ inch diameter. Threads of all bolting shall be coated with an appropriate anti-seize compound prior to assembly.

A minimum of two (2) manholes shall be provided for all tanks and voids with over 500 cubic feet of permeable volume. For tanks and voids having between 100 cubic feet and 500 cubic feet of permeable volume and cofferdams, one (1) manhole and one (1) opening fitted with a cover for an eight (8) inch ventilation hose may be provided in lieu of the two manholes. In either arrangement, the openings shall be located at the diagonal extremities of the space. For tanks, voids or cofferdams with less than 100 cubic feet of permeable volume, only one (1) manhole need be fitted, and the ventilation hose opening may be omitted.

4.8 BOLTED ACCESSES

Bolted access plates shall be provided in decks and bulkheads where needed to allow for periodic or emergency access for operation, maintenance and/or admittance, and removal of safety equipment, rudder stocks, steering gears, and similar equipment/items.

The Steering Gear removal bolted accesses shall be sized to accommodate the removal of each Steering Gear as an assembly. The openings and covers shall be structurally designed and installed for a minimum yield factor of 2.4 on stress for mild steel, and support the weight of legally loaded commercial trucks driving repeatedly over them. The covers shall be designed to bolt in place so to eliminate any cutting and welding requirements for removal

and reinstall of the covers in the Lower Vehicle Deck. The openings shall be gasketed watertight (and include gasket stops to prevent cutting of the gaskets when driven over) when installed and held in place with flush "substantial" fasteners, and include a minimum of four (4) removable lifting padeyes and jacking bolts to assist in removal. After installation, the removable lifting padeyes shall be turned over to the WSF Representative. All fastener, jacking bolt, and padeye openings shall be caulked flush after installation. Threads of all screws shall be coated with an appropriate anti-seize compound prior to assembly. The entire access design shall be reviewed and approved by the WSF Representative prior to fabrication.

All other bolted accesses in the Lower Vehicle Deck, in passageways and where deck covering is installed, shall be installed so that the top of the cover plate and bolts are flush with the finished deck or deck covering. Hand grips for removal of flush deck access shall be designed so as not to present a trip hazard. All bolted accesses, except as noted, shall be secured with flush stainless steel, countersunk, square head, machine screws of at least $^{5}/_{16}$ inch diameter. Threads of all screws shall be coated with an appropriate anti-seize compound prior to assembly.

4.9 INTERFERENCE FREE ZONES

WSF requires "Interference Free Zones" (Machinery Removal Deck Plate Access Areas) over all machinery spaces, and over the Steering Gears. "Interference Free Zones" shall be free of all cableways. Equipment shall not be attached to these areas unless unavoidable. Piping and ventilation ductwork shall be routed around these areas, and equipment **shall not** be located in these areas unless it can be shown impracticable and is approved in writing by the WSF Representative. In such cases, piping and ventilation ductwork shall be installed using approved "takedown joints" and equipment foundations made mechanically separable to allow for ready removal.

The Contractor shall designate proposed "Interference Free Zones" as part of the Phase II Technical Proposal documentation.

4.10 SPARE PARTS AND INSTRUCTION MANUALS

Provide a list of recommended spare parts and special tools for those items furnished, together with parts lists and instruction manuals necessary to maintain and service provided equipment and accessories in accordance with the requirements of Sections 86 and 100 of the Technical Specification.

4.11 TESTS, TRIALS AND INSPECTIONS

Tests and/or trials shall be in accordance with this Section and Section 101 of the Technical Specification.

Inspections shall be performed as defined in this Section and Sections 1 and 2 of the Technical Specification.

4.12 PHASE II TECHNICAL PROPOSAL REQUIREMENTS

The following deliverables, in addition to other deliverables required by Section 100 of the Technical Specification and the Authoritative Agencies, shall be provided during the Phase II Technical Proposal stage of Work in accordance with the requirements of Section 100 of the Technical Specification:

A. Non-Watertight Doors Summary List and Details

B. Watertight Doors, Hatches, Scuttles, Manholes, and Closures Summary List and Details

Separate ***Non-watertight Door Summary List and Details*** and ***Watertight Doors, Hatches, Scuttles, Manholes, and Closures Summary List and Details*** shall be provided. These two separate summary lists shall specify the door/closure type, location, swing (hand), material type, fire rating, water rating, clear opening, louver, fixed light, hose port, remarks, and other information pertinent to conceptually definition of the doors/closures as applicable.

Manufacturers' and other information defining the make, model and features of the sliding watertight doors shall be provided.

See Section 100 of the Technical Specification for additional requirements regarding technical documentation.

4.13 PHASE III DETAIL DESIGN AND CONSTRUCTION REQUIREMENTS

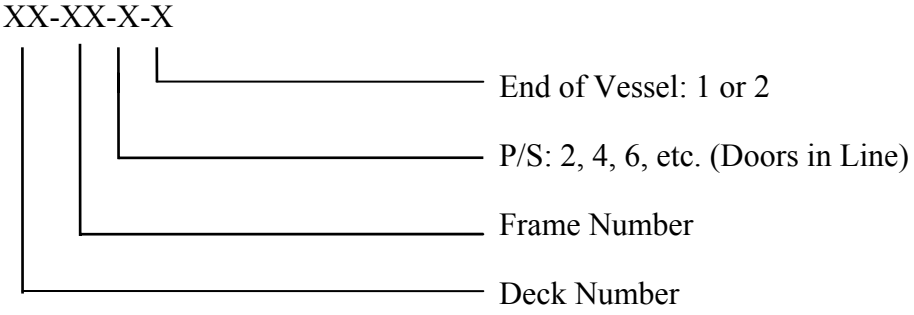
The deliverables required by Section 100 of the Technical Specification and the Authoritative Agencies, shall be provided during the Phase III Detail Design stage of Work in accordance with the requirements of Section 100 of the Technical Specification:

The ***Non-watertight Door Schedule*** and ***Watertight Doors, Hatches, Scuttles, Manholes, and Closures Schedule*** as required by Section 100 of the Technical Specification shall specify the door number, type, location, swing (hand), material type and gauge for door and

frame, fire rating, clear opening, sill and coaming height, bulkhead thickness and cut-out dimensions, door and frame finish, louver, fixed light, hose port, hold-back and other accessories, hardware set, typical door and frame details, remarks, and other information pertinent to complete definition of the doors. The manufacturer(s) of the doors and closures shall be provided separately or as part of the schedules, coded to the door/closure numbers if more than one (1) manufacturer is intended.

Some door/closure information (sill/door height, etc.) may change to suit final design development. The Final As-Built working drawings shall include all remaining door/closure hardware information plus a door/closure identifier column depicting deck level number, frame number, End number, port or starboard side, generally as follows:

Door Number Legend



Deck Level Number Legend

01 – Engine Rooms/Hold Areas

02 - Lower Vehicle Deck

03 - Upper Vehicle Deck

04 - Passenger Deck

05 - Sun Deck

06 - Navigation Bridge Deck

An index shall be provided to clarify the above. Non-watertight and watertight door and closure numbering shall be two (2) separate lists starting at the number one deck level, No. 1 End working aft, with port numbers being even and starboard numbers being odd, except that the watertight door numbers shall be proceeded with a "WT/" (e.g. WT/XX-XX-X-X.

See Section 100 of the Technical Specification for additional requirements regarding technical documentation.

(END OF SECTION)